

WE CLAIM:

1. A method of securing a sealing washer to one surface of a metal sheet while welding a fastener to a second surface of a metal sheet;
the method comprising:
bonding the fastener to the first surface of the sheet by a process which to achieve such bonding heats the second surface of the sheet proximate to the fastener,
urging a sealing washer into the second surface while so heated to heat the sealing washer and thereby bond the sealing washer to the second surface.
2. A method as claimed in claim 1 wherein the metal sheet having an opening therethrough,
the fastener having a head, the head of the fastener being bonded to a second surface of the metal sheet about the opening, and the washer being bonded to the second surface of the metal sheet about the opening.
3. A method as claimed in claim 2 wherein the fastener comprises a stud with a shank extending from the head through the opening through the metal sheet.
4. A method as claimed in claim 2 wherein the fastener comprises a nut with an aperture therethrough positioned in alignment with the opening through the metal sheet.
5. A method as claimed in claim 2 wherein the process by which the fastener is bonded to the first surface of the sheet is selected from welding, brazing and soldering.
6. A method as claimed in claim 2 wherein the process by which the fastener is bonded to the first surface of the sheet is a welding process selected from resistance welding and drawn-arc welding.

7. A method as claimed in claim 2 wherein the sealing member is urged into the heated second surface while the sealing member is held in a washer holder having a face with a socket extending into the holder from the face and adapted to receive the washer therein for urging the washer into contact with the second surface.

8. A method as claimed in claim 7 wherein the washer comprises a compressible member of having a thickness when uncompressed,

the socket extending into the holder to a socket end a depth less than the thickness of the washer when uncompressed whereby with the face contacting the second surface, the washer is compressed between the socket end and the second surface.

9. A method as claimed in claim 8 wherein the socket extends into the holder to a socket end,

a piston is slidably disposed within the socket,

a washer reception space is provided in the socket outwardly from the piston,

the piston is biased outwardly from the socket and thereby urge the washer into the second surface.

10. A method as claimed in claim 9 wherein the piston is movable between a retracted inner position and an outer position,

in the retracted inner position, the washer reception space is provided in the socket between the piston and the face of sufficient depth to receive the washer fully within the socket and spaced inwardly from the face,

in movement of the piston towards the outer position, the piston urges the washer into the second surface.

11. A method as claimed in claim 9 including a mechanism to move the piston between the inner and outer positions and control the timing of when the piston urges the washer into the second surface relative to when the first surface is heated.

12. A method as claimed in claim 11 wherein the mechanism comprises a pneumatic mechanism.

13. A method as claimed in claim 2 including compressing the head onto the second surface of the sheet between a first electrode engaging the head and a second electrode engaging the first surface of the sheet, welding the head to the second surface of the sheet by electrical resistance welding to heat the first surface of the sheet proximate to the first electrode, and urging a sealing washer into the heated first surface with the second electrode to heat the sealing washer and thereby bond the sealing washer to the first surface.

14. A method as claimed in claim 13 wherein the two electrodes comprise:
a first electrode engaging the fastener and urging it into the first surface, and a second electrode engaging the second surface,
the first and second electrodes sandwiching the fastener and sheet therebetween,
the washer disposed intermediate the second electrode and the second surface and urged into the second surface by the second electrode.

15. A method as claimed in claim 14 wherein the second electrode having a face to contact the second surface,
a socket extending into the electrode from the face and adapted to receive the washer therein for urging the washer into contact with the second surface while the face contacts the second surface.

16. A connecting plate comprising
a metal sheet having a first surface and a second surface with an opening therethrough,
a metal nut having an aperture therethrough,

the nut welded to the first surface with the aperture of the nut in alignment with the opening,

a sealing washer with a hole therethrough,

the sealing washer secured to the second surface with the hole of the washer in alignment with the opening,

the washer secured to the second surface by a process including urging the washer into the second surface while heating the washer with heat generated by welding of the nut to the metal sheet.

17. A plate as claimed in claim 16 wherein the heat is generated by electrical resistance welding of the nut to the metal sheet between two electrodes.

18. A connecting plate comprising

a metal sheet having a first surface and a second surface with an opening therethrough,

a stud having a head and a shank extending therefrom,

the head of the stud welded to the first surface with the shank extending through the opening,

a sealing washer with a hole therethrough,

the sealing washer secured to the second surface with the hole of the washer in alignment with the opening,

the washer sealed to the second surface by a process including urging the washer onto the second surface while heating the washer with heat generated by welding of the head of the stud to the metal sheet.

19. A plate as claimed in claim 18 wherein the heat is generated by electrical resistance welding of the stud to the metal sheet between two electrodes.

20. An electric resistance welding electrode having an electrode face to engage a surface of a metal element,

a socket extending into the electrode from the face to a socket end,

the socket adapted to receive a seal member therein and for urging the seal member into the surface of the metal element while the electrode face engages the surface.

21. An electrode as claimed in claim 16 wherein the socket including a central bore therethrough adapted to receive a shank of a fastener member extending from the surface outwardly.

22. An electrode as claimed in claim 17 wherein the socket includes an annular space about the bore terminating at the socket end as an annular shoulder,

the seal member comprising an annular washer;

the annular space sized to receive the annular washer therein.